

REMARKS

The Office Action mailed September 7, 2006, has been carefully reviewed and the foregoing amendment has been made in response thereto.

The disclosure stands objected to because the examiner believes that removal of the definition of "noise, vibration, and harshness" reinstates confusion as to what the term means. The Office action indicates that the defined term would be acceptable; therefore, the specification has been amended to reinstate the term "noise, vibration, and harshness."

Claim 1 stands objected to because of an formality with respect to the article "an" in the phrase "an heat shield." Claim 1 has been amended to substitute the article "a" in that phrase.

Claim 4 stands rejected under 35 USC 112, first paragraph. Claim 4 has been amended to clarify that the composition of the Al-Si alloy stated in the claim is with reference to weight of Si. Support for this is present in the specification, paragraph [0023].

Claims 1-2, 4-7, and 13 stand rejected under 35 U.S.C. 103(a) as unpatentable over the admitted state of the prior art in view of Smith (US Patent 2,355,568), Hartsock et al. (US Patent 5,530,213), Masumoto et al. (US Patent 4,859,252), Kim (US Patent 6,206,459), and Cremers et al. (US Patent Document 2002/0035456). The Office action says that the admitted state of the prior art teaches all the features of the rejected claims except (1) locating the regions of the heat shield having high vibrations, (2) composition of the Al-Si alloy, (3) the stainless steel heat shield of Claim 6, (4) securing the heat shield to a catalytic converter in the exhaust system of an automotive vehicle and running the engine of the vehicle and locating the regions, and (5) that the locating step includes identifying the regions with a laser vibration scan or sound pressure recording. In making this rejection the Office action cites Kim and Cremers for their disclosing computer aided engineer techniques, yet the term "computed aided engincering" appears no where in the claims presented for prosecution.

Kim describes and claims a structural reinforcement that increases the strength of a component in order to reduce road noise in the passenger compartment of a motor vehicle. Various reinforcements to the original structure were added to increase the strength of a wheel cover, both locally and over a larger area of the cover. Kim apparently employs computer aided engineering in the form of a structural mathematical model of the cover to determine the locations where reinforcement is desirable. Kim does not disclose using an actual wheel cover located and supported as it would be in a motor vehicle to determine where stiffness should be increased. Instead, Kim teaches using a mathematical model, which does not use the actual boundary conditions or the actual structure of the wheel cover. Kim states that as a result of normal mode analysis of the wheel housing cover, wheel housing and inner panel of a conventional rear wheel housing it has been found that the vibration level of the wheel housing panel is increased over various ranges of frequencies, not vehicle speed. Kim is concerned with the frequency of the noise and resonances that the noise produces within the vehicle body. In order to solve this problem, Kim employs the math model of the wheel cover to develop local reinforcements, which increase the strength of the subject structure. Kim discloses nothing about spray coating. Instead Kim added structural members, shown in Figs. 4-8, to increase the strength of the original assembly. Kim neither discloses nor suggests securing a heat shield to a catalytic converter in an exhaust system of an automotive vehicle engine, running the engine, or locating the regions of a heat shield where the highest levels of vibration occur while running the engine. Kim does not mention any interest in high levels of vibration. Kim is concerned with exciting resonant frequencies of the structure. Kim changes the resonant frequencies by strengthening the structure. Kim says that in order to reduce road noise, an increase of strength of a chassis mounting unit such as a suspension, sub-frame, rear cross-member, and the like is required. Kim attempts to attenuate noise levels within the vehicle by stiffening a component. The method of defined by the claims of the present application makes no attempt to stiffen the component; instead it applies a thermal coating to the areas of highest vibrations to attenuate the vibratory displacement by adding mass and a dampening material to the structure of the component.

The Office action states that Kim refers to vibration due to load input into the vehicle body while the body is running, and cites col. 1, ll. 10-50 as supporting this conclusion. No where in the cited text does the Kim patent states that a vehicle body receives load input from a road surface via a suspension system while a vehicle is running. Kim describes booming frequencies ranges between 200 Hz and 400 Hz, and determines from a mathematical model of the structure the vibration response. Kim does not disclose determining the vibration levels and measuring vibrations of the actual structure while it is operating. Instead, Kim applies computer aided engineering techniques to a mathematical model, and excites the model in various frequency ranges.

Cremers refers in its Paragraph [0006] to a computer aided engineering process for evaluating and optimizing the acoustic performance of structures. The process include the ability to predict acoustic radiation pattern from a vibrating structure using computed or measured surface vibration and the ability to recover surface vibration onto a vibrating structure from measured field to sound pressure level. Cremers does not discuss the technique of securing a structure another component, such as the exhaust system of an automotive vehicle engine, operating the engine, and determining locations of highest vibration. Cremers is silent as to applying a thermal coating to those located regions.

In view to the amendments to the claims and the remarks, the claims presented for prosecution, Claims 1-2, 4-6, and 12, appear now in condition for allowance.

Respectfully submitted,



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